Fertility Preservation in AYA Cancer Patients

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Fertility Preservation Options

Fertility preservation options for girls and young women:

- Embryo cryopreservation
- Ovarian transposition
- Experimental – freezing mature oocytes (2-3% success rate)
- Experimental - gonadal protection – GnRHa (conflicting evidence)
- Experimental – ovarian tissue cryopreservation***

Fertility preservation options for boys and young men:

- Semen collection and storage – potential surgical semen extraction
- Testicular biopsy with freezing of testicular tissue or spermatozoa retrieved from the tissue.

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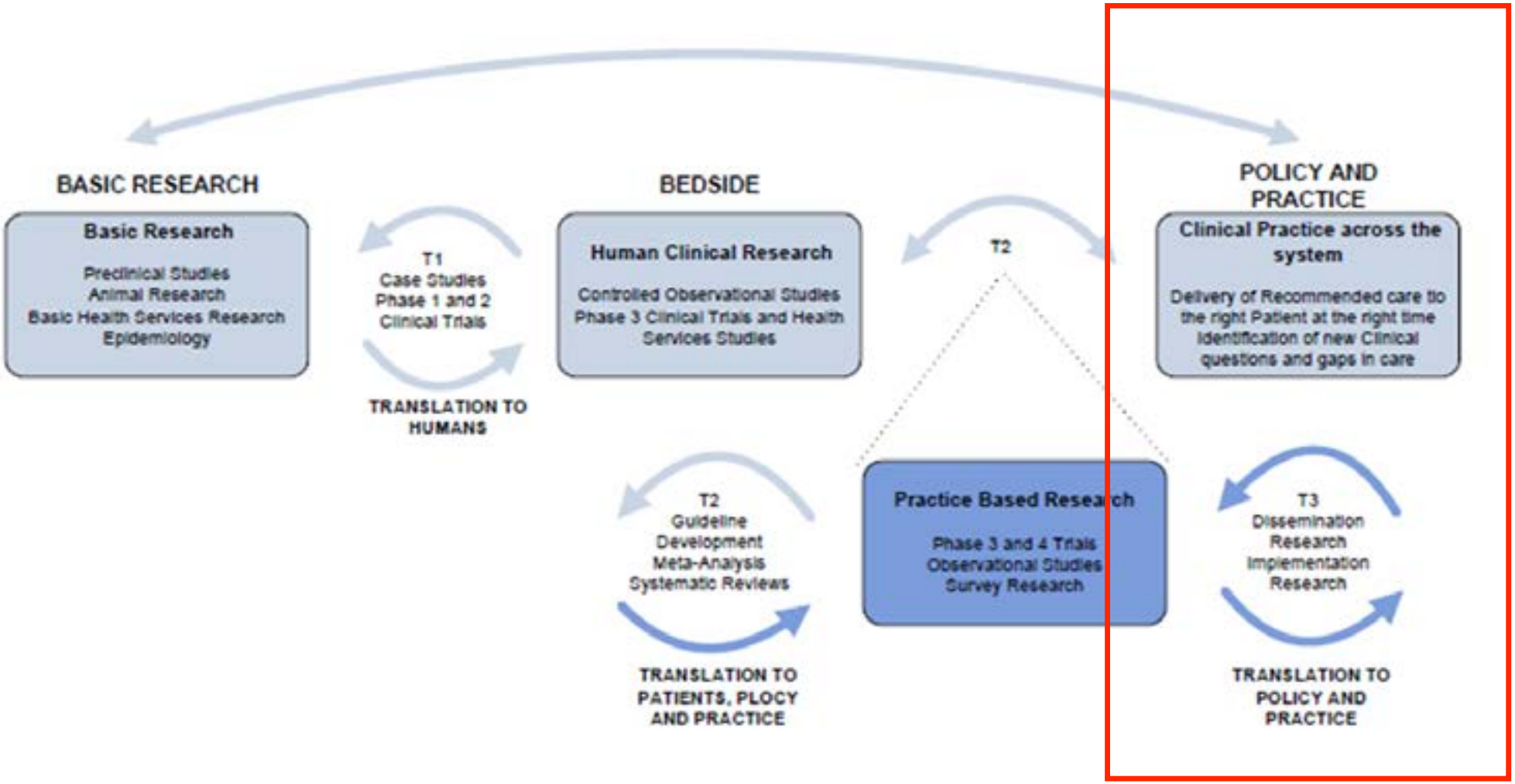
Focus of this Presentation



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Fertility Preservation in AYA Cancer Patients

- Health professionals' and health services' responses to the needs of cancer survivors
- Implementation research in cancer survivorship

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ASCO Guidelines Bottom Line (2018 Update)

Role of Health Care Providers

Recommendation 4.1: All oncologic health care providers should be prepared to discuss infertility as a potential risk of therapy (as soon as possible once a cancer diagnosis is made).

Recommendation 4.3: Refer patients who express an interest in fertility, as well as those who are ambivalent or uncertain, to reproductive specialists as soon as possible.

Recommendation 4.4: Refer patients to psychosocial providers when they are discussed about potential infertility.

Oktay et al 2018 JCO

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COSA Guidelines

COSA Guidelines AYA Cancer Fertility Preservation (2014):

- Many young people report feeling that:
  - They were not, or were inadequately, advised of the risk or their options for preserving fertility.
  - The decision about whether to pursue fertility preservation or not was made for them
  - They were not given enough time to discuss concerns
  - They did not fully understand the ramifications of the decision.

COSA 2014

Lee et al, JCO, 2006; Achille et al Hum Reprod 2006; Crawshaw et al Eur J Cancer Care 2009

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Oncology Practitioners Perspective and Practices

Chan et al. BMC Cancer (2017) 17:715
DOI 10.1186/s12885-017-3733-3

BMC Cancer

RESEARCH ARTICLE Open Access

Oncology practitioners' perspectives and practice patterns of post-treatment cancer survivorship care in the Asia-Pacific region: results from the STEP study

Raymond Javan Chan[1,2*], Patsy Yates[1,2], Qiuping Li[3], Hiroko Komatsu[4], Violeta Lopez[5], Myat Thandar[6], Selva Titus Chacko[7], Winnie Kwok Wei So[8], Kanaungnit Pongthavornkamol[9], Myungsun Yi[10], Pongpak Pittayapan[11], Jessica Butcon[12], David Wyld[2], Alex Molassiotis[13] and on behalf of the STEP study collaborators

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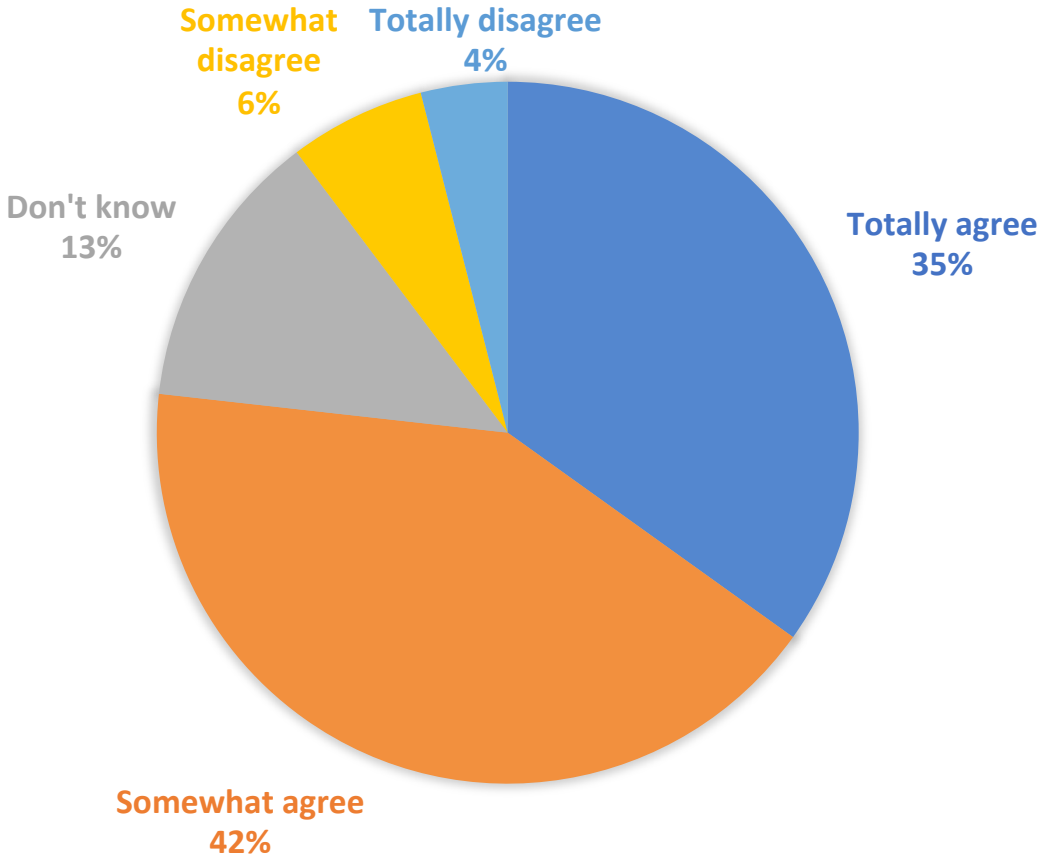
Oncology Practitioners Perspective and Practices in the APAC Region (n=1,501)

- Should *discussing fertility options and issues* be part of your role?



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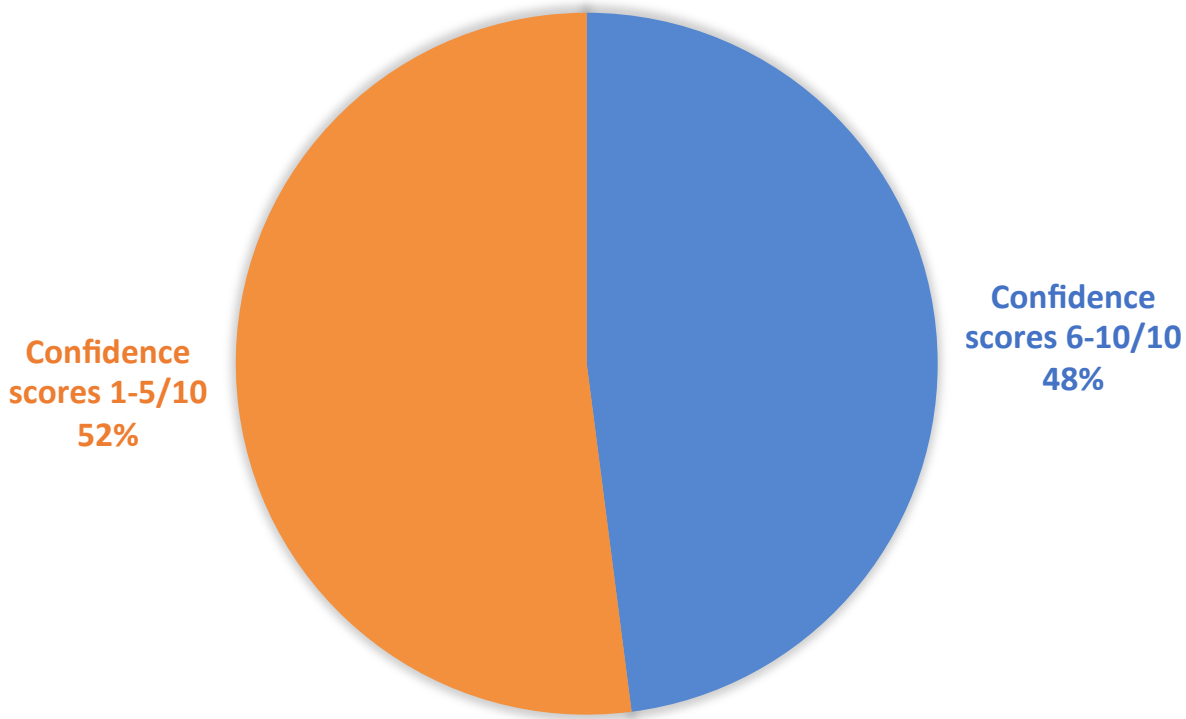
Oncology Practitioners Perspective and Practices in the APAC Region (n=1,501)

- **How confident are you in *discussing fertility issues and options*?** Mean (SD) =5.69 (3.05)



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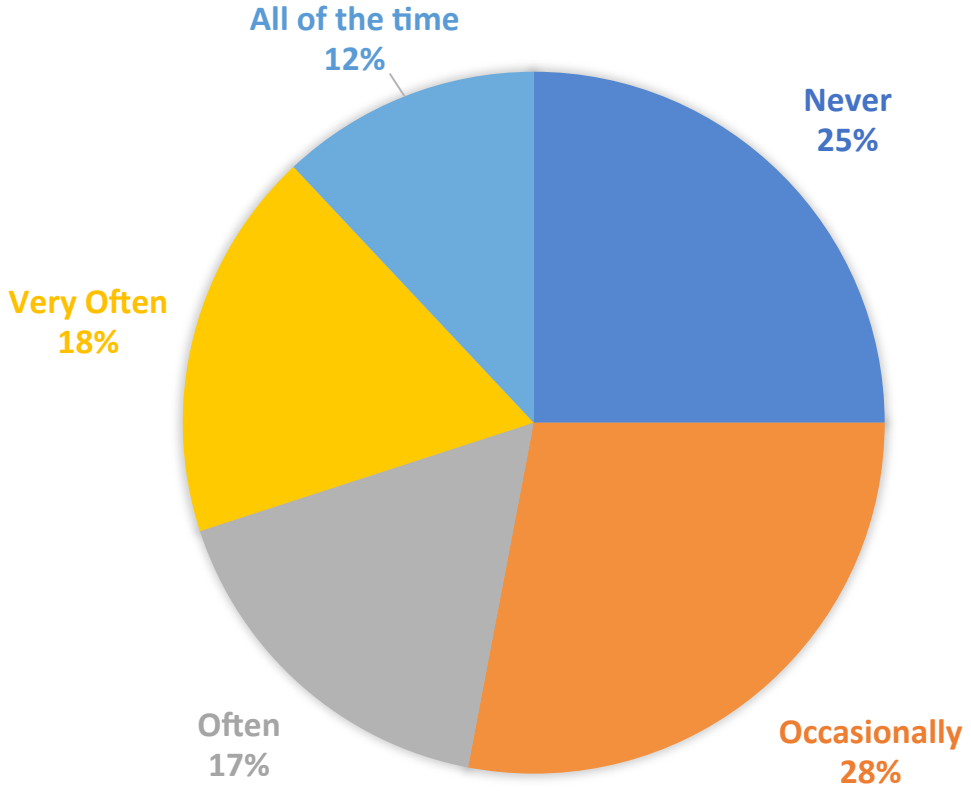
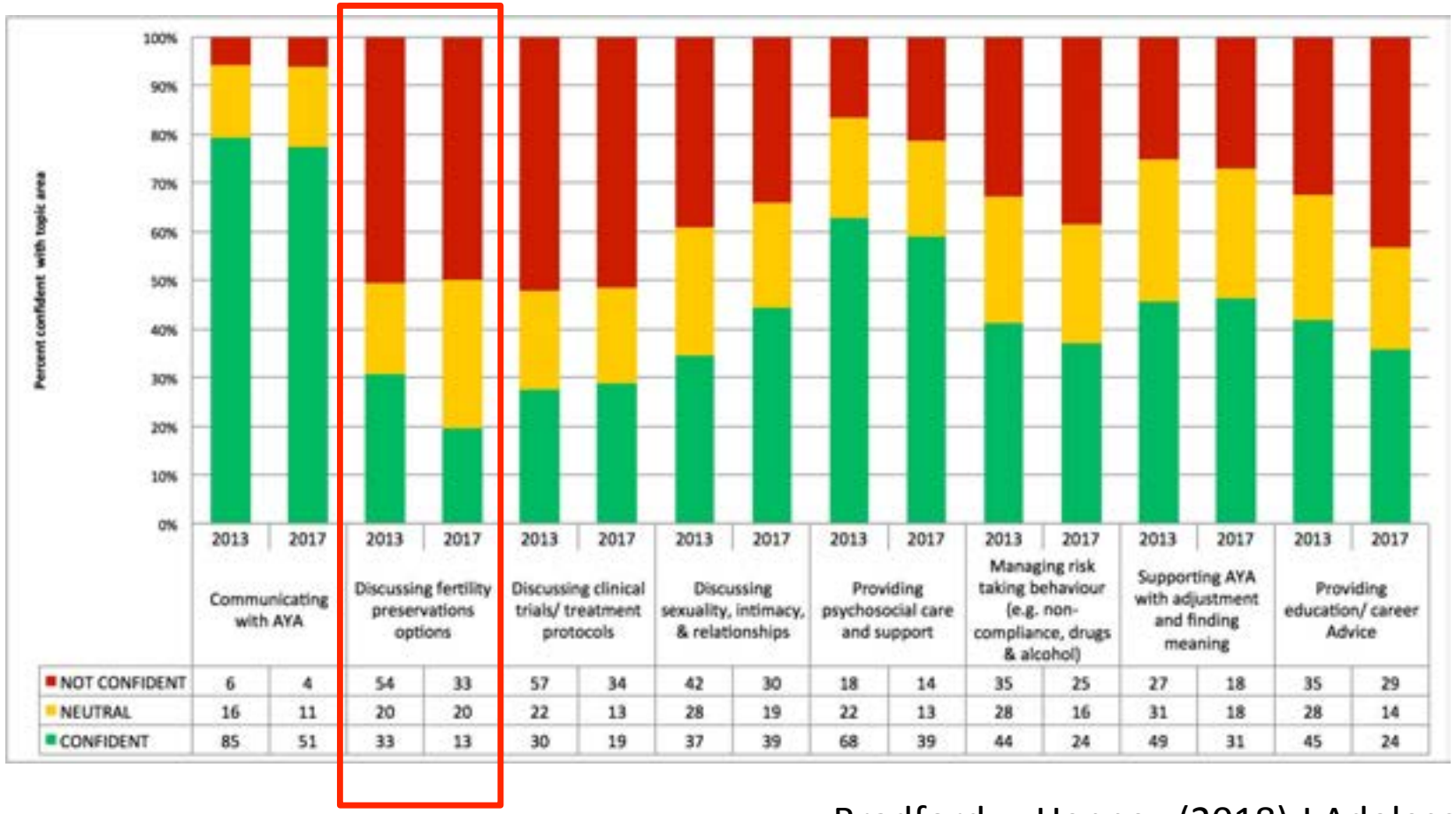
Oncology Practitioners Perspective and Practices in the APAC Region (n=1,501)

- **How frequently do you *discuss fertility options and issues* in your practice?**



Preparedness of Australian Oncology Health Professionals

Youth Cancer Services- Queensland Survey of Health Professional Educational Needs (2013- *n*=122; 2017- *n*=73)



	Communicating with AYA		Discussing fertility preservations options		Discussing clinical trials/ treatment protocols		Discussing sexuality, intimacy, & relationships		Providing psychosocial care and support		Managing risk taking behaviour (e.g. non-compliance, drugs & alcohol)		Supporting AYA with adjustment and finding meaning		Providing education/ career Advice	
	2013	2017	2013	2017	2013	2017	2013	2017	2013	2017	2013	2017	2013	2017	2013	2017
NOT CONFIDENT	6	4	54	33	57	34	42	30	18	14	35	25	27	18	35	29
NEUTRAL	16	11	20	20	22	13	28	19	22	13	28	16	31	18	28	14
CONFIDENT	85	51	33	13	30	19	37	39	68	39	44	24	49	31	45	24

43% Nursing staff
10% Medical staff
46% Allied Health

Bradford,… Henney (2018) J Adolesc Young Adult Oncol

Implementation Study

Aim: To improve documented discussion about risk of infertility and fertility preservation options

Population: AYA patients aged 14-25 years at the time of a cancer diagnosis during 2012-2014/2015-2016

Intervention:

- **Year 2015**

Data collection periods:

- Pre-test: 2012-2014 (Medical Records)
- Post-test: 2015-2016 (QOOL Data)

Five Major Cancer Centres

Tertiary Metro Queensland, Australia:

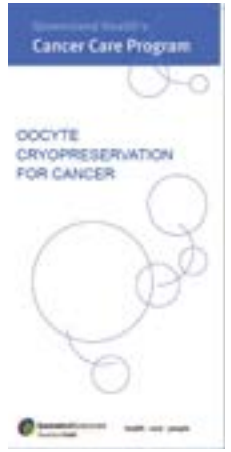
- Lady Cilento Children's Hospital
- Royal Brisbane and Women's Hospital
- Princess Alexandra Hospital

Tertiary Regional Queensland, Australia:

- Townsville Hospital
- Gold Coast University Hospital

Bundled Intervention

- Development of Quality Indicators
  - Prospectively collected and entered into QOOL for all patients referred to Youth Cancer Services → regular feedback to clinicians
- Targeted Education
  - For clinicians at across cancer centres
- Patient Resources
  - Gender-specific patient resource packs for newly diagnosed patients
- Referral Pathways
  - Pathways, procedure and work instruction forms



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Results

Variable		Pre-intervention (2012-2014) N=260	%	Post intervention (2015-2016) N=216	%	Chi square *p* value
Age at diagnosis						
	14-19	121	47%	102	47%	p=0.96
	20-25	139	53%	114	53%	
Gender						
	Male	153	59%	128	59%	p=0.93
	Female	107	41%	88	41%	
Cancer Diagnosis						
	Leukaemia	50	19%	39	18%	p=0.46
	Lymphoma	60	23%	63	29%	
	Brain cancer	35	13%	23	11%	
	Bone sarcoma	26	10%	27	13%	
	Soft tissue sarcoma	18	7%	18	8%	
	Germ cell tumour	37	14%	29	13%	
	Carcinoma	24	9%	13	6%	
	Other	10	4%	4	2%	
Type of treatment						
	Multimodal	108	42%	96	44%	p=0.006
	Chemotherapy only	104	40%	102	47%	
	Surgery +/-localised radiotherapy	*48*	*18%*	*18*	*8%*	
Toxicity of treatment on gonads						
	Intermediate to high risk	195	75%	168	78%	p=0.55
	Low to no risk	65	25%	48	22%	

Results

Variable	Pre intervention N=260 (%)	Post intervention N=216 (%)	Chi-square p value
Evidence risk of infertility discussion			
Yes No	**159 (61%)** 101 (39%)	**194 (89%)** 22 (11%)	*p*<0.001
Documented fertility preservation outcomes			
Yes No	**93 (36%)** 167 (64%)	**100 (46%)** 116 (54%)	*p*=0.02

Significant Improvements observed in post-intervention data collection:

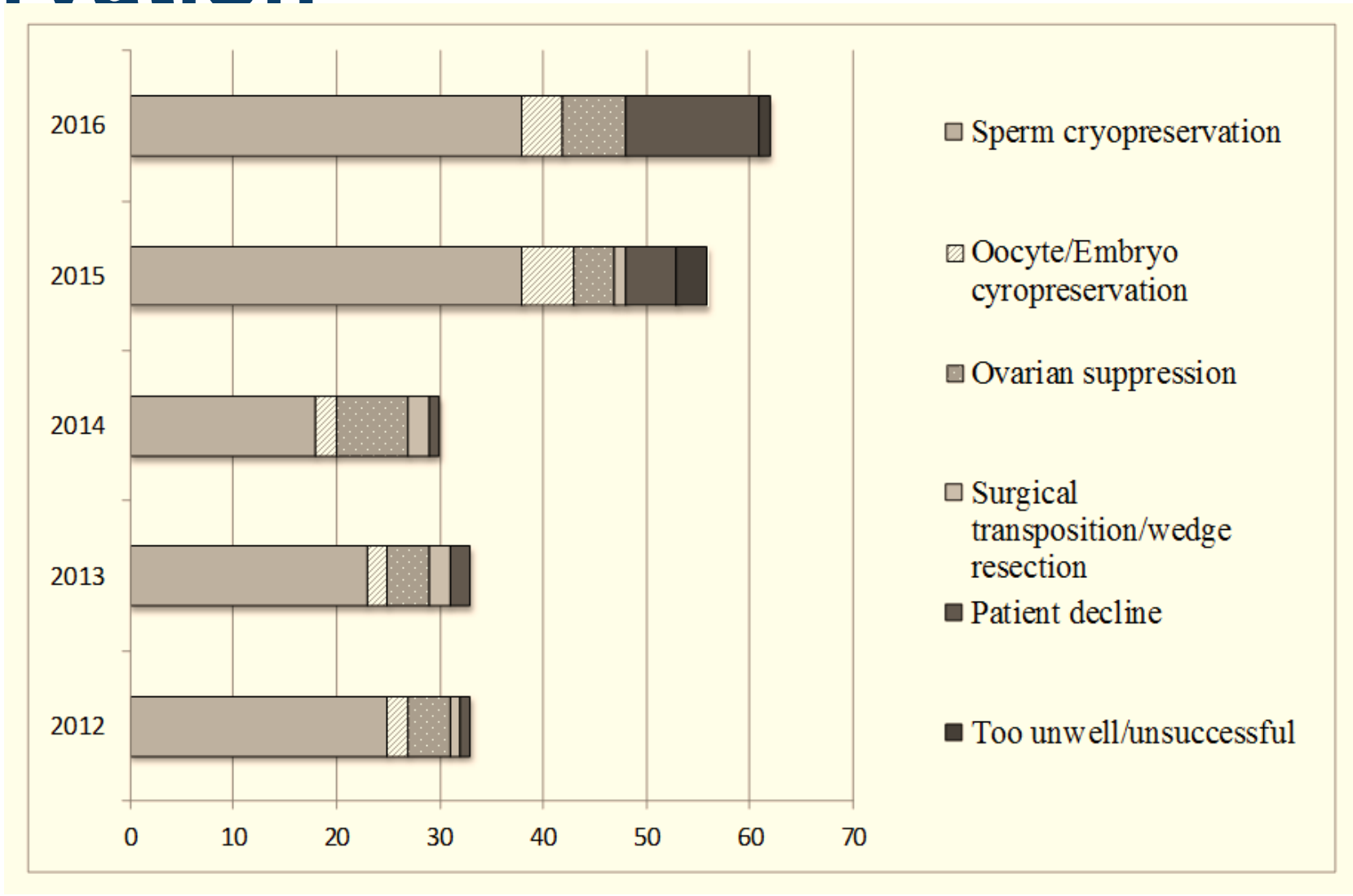
Evidence of risk of infertility discussion (RR 1.47 95%CI: 1.12-1.63, *p*<0.001)

Documented referrals to fertility specialist (RR 1.53, 95%CI: 1.26-1.87, *p*<0.001)

Documented fertility preservation outcomes (RR 2.56, 95%CI: 1.19-3.44, *p*<0.001)

Results – Number of Preservation

Intervention roll out in 2015



Counts – Preservation Outcomes

Results – Documented Discussion

TABLE 2. DOCUMENTED RISK OF INFERTILITY DISCUSSION BY GENDER, AGE, AND DISEASE PRE-INTERVENTION ($N=260$) AND POST-INTERVENTION ($N=216$)

	Pre-intervention		*Post-intervention*			
Variable	*n/total n*	*%*	*n/total n*	*%*	*RR (95% CI)*	p
Gender						
Males	104/153	68	117/128	91	1.35 (1.19–1.5)	<0.001
Females	55/107	51	77/88	88	1.70 (1.39–2.08)	<0.001
Age group						
14–19 years	72/121	60	88/102	86	1.45 (1.22–1.71)	<0.001
20–25 years	87/139	63	106/114	93	1.48 (1.29–1.70)	<0.001
Disease						
Leukemia	35/50	70	36/39	92	1.32 (1.07–1.62)	0.008
Lymphoma	48/60	80	59/63	94	1.27 (0.99–1.63)	0.06
Brain cancer	12/35	34	17/23	74	2.15 (1.03–3.62)	0.004
Bone sarcoma	19/26	73	26/27	96	1.32 (1.03–1.69)	0.03
Soft tissue sarcoma	5/18	28	13/18	72	2.60 (1.17–5.78)	0.02
Germ cell tumor	24/37	65	28/29	97	1.49 (1.16–1.91)	0.002
Carcinoma	14/24	58	12/13	92	1.58 (1.09–2.30)	0.02
Other	2/10	20	3/4	75	3.75 (0.96–14.65)	0.06
All patients	159/260	61	194/216	90	1.47 (1.12–1.63)	<0.001

RR, relative risk; CI, confidence intervals.

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Results - Documented Preservation Outcomes

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TABLE 4. DOCUMENTED OUTCOMES OF FERTILITY PRESERVATION BY GENDER, AGE, AND DISEASE, PRE-INTERVENTIONS ($N=260$) AND POST-INTERVENTION ($N=216$)

	Pre-intervention		*Post-intervention*			
Variable	*n/total n*	*%*	*n/total n*	*%*	*RR (95% CI)*	p
Gender						
Males	31/153	20	75/128	59	2.89 (2.05–4.09)	<0.001
Females	16/107	15	25/88	28	1.90 (1.08–3.33)	0.0025
Age group						
14–19 years	17/121	14	26/92	28	2.01 (1.16–3.48)	0.025
20–25 years	30/139	22	64/114	54	2.60 (1.82–3.71)	<0.001
Disease						
Leukemia	10/50	20	14/39	36	1.43 (0.70–2.90)	0.32
Lymphoma	15/60	25	34/63	54	2.16 (1.32–3.54)	0.002
Brain cancer	5/35	14	7/23	30	2.13 (0.77–5.91)	0.15
Bone sarcoma	5/26	19	16/27	59	3.08 (1.32–7.18)	0.009
Soft tissue sarcoma	1/18	6	5/18	28	5.00 (0.66–38.65)	0.12
Germ cell tumor	8/37	22	17/29	59	2.71 (1.37–5.38)	0.004
Carcinoma	3/24	13	6/13	46	3.69 (1.10–12.39)	0.03
Other	0/10	—	1/4	25	6.60 (0.32–135.38)	0.22
All patients	47/260	18	100/216	46	2.56 (1.19–3.44)	<0.001

Results – Variables Associated with Documented Preservation Outcomes

TABLE 5. POST-INTERVENTION COHORT, COMPARISON OF VARIABLES ASSOCIATED WITH DOCUMENTED FERTILITY PRESERVATION OUTCOMES (N=216)

	Documented outcome of fertility				
Variable	*Yes*	*%*	*No*	*%*	*RR[a] (95% CI); p*
Age group at diagnosis					
14–19	26	28	76	72	0.50 (0.35–0.72); 0.0002
20–25	64	56	50	44	
Gender					
Male	75	59	53	41	2.06 (1.44–2.96); 0.0001
Female	25	28	63	72	
Cancer diagnosis					
Leukemia	14	36	25	64	0.74 (0.47–1.15); 0.18
Lymphomas	34	54	29	46	1.25 (0.93–1.67); 0.13
Brain cancers	7	30	16	70	0.63 (0.33–1.18); 0.16
Bone sarcomas	16	59	11	41	1.33 (0.94–1.89); 0.11
Soft tissue sarcomas	5	28	13	72	0.52 (0.24–1.13); 0.09
Germ cell tumors	17	59	12	41	1.32 (0.94–1.87); 0.11
Carcinomas	6	46	7	54	0.99 (0.54–1.83); 0.99
Other	1	25	3	75	0.53 (0.09–2.9); 0.47

[a]Fourteen to 19 compared to 20–25 years, males compared to females, each disease compared to sum of all other diseases.

Limitations

- Retrospective nature of the pre-intervention cohort (reliance on medical records)
- Pre- and post- data collection sources were different (medical records vs a prospective data reporting mechanism)
- Nevertheless, documentation is extremely important in survivorship care practices. Failure to document impedes future clinical interventions and may have medico-legal consequences

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Discussion

- The disparities between gender and disease groups were closed to a certain extent with the introduction of interventions
- We were not able to demonstrate improvements in *documented referrals to specialists* and *outcomes of fertility preservation* in leukaemia patients
- Implementation research (quality improvement studies) should be afforded in the local context to enhance guidelines driven care
- The field of ovarian tissue cryopreservation is advancing quickly and will continue to evolve – *health professionals should pay notice to new evidence-based guidelines*

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Thank you

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